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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is included. (AG)

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TECHNICAL REPORT

ON

STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

NURSE AIDE (med. ser.) 2-42.20

355-878

B-561

(Supersedes B-327)

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U. S. Employment Service
in Cooperation with
California, Utah and Pennsylvania
State Employment Services

September 1963

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STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

NURSE AIDE (med. ser.) 2-42.20

B-561

Summary

The General Aptitude Test Battery was administered to two samples of Nurse Aides 2-42.20 for the purpose of validating and cross-validating occupational norms. The date of criterion data collection, criterion type and the number in each final sample are shown below:

Sample	Year	Criterion	N
Validation (California)	1963	Supervisory ratings	199
Cross-Validation (Utah and Pennsylvania)	1953-4	Supervisory ratings	155

GATB Norms for Nurse Aide 2-42.20, B-561.

B-1001			B-1002		
Aptitude	Tests	Minimum Acceptable Aptitude Score	Aptitude	Tests	Minimum Acceptable Aptitude Score
G	CB-1-H CB-1-I CB-1-J	85	G	Part 3 Part 4 Part 6	80
V	CB-1-J	80	V	Part 4	80
T	CB-1-T	80	K	Part 8	85

Effectiveness of Norms

The data in Table IV-A indicate that only 66 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 78 percent would have been good workers, 34 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 22 percent would have been poor workers.

TECHNICAL REPORT

I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Nurse Aide 2-42.20.

II. Sample

Validation Sample (California)

The GATB, B-1002B, was administered during the period July 9, 1962 through May 7, 1963 to a sample of 16 male and 211 female Nurse Aides employed by various hospitals affiliated with the Los Angeles County Hospital System. The sample was a representative cross section of workers in all of the hospitals. Senior Nurse Aides were excluded to insure that all of the individuals in the study were performing comparable work. All individuals included in the final sample had completed the three-month training period. Two males and 26 females were excluded from the final sample because of invalid test results, resulting in a final sample comprised of 199 individuals (14 males and 185 females) employed by the following hospitals:

Name of Hospital	Number Tested
Los Angeles County General	62
Harbor General	34
John Wesley	16
Long Beach General	25
Olive View	24
Rancho Los Amigos	38
	199

Each hospital within the Los Angeles County Hospital System had independent hiring authority. Applicants must be able to read, write and speak English. There are no fixed age requirements. After applicants prepare standard employment forms, they are screened by oral interviews with the Personnel Officer or the Director of Nurses.

Those initially selected as suitable are administered a Los Angles County Civil Service General Knowledge Test comprised of thirty questions. Applicants who pass the test with a minimum of 70 percent correct are evaluated in a final interview for desirable personal traits and fitness for the work.

TABLE I- A

Means (M), Standard Deviations (σ), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

Validation Sample (California)

N =199	M	σ	Range	r
Age (years)	39.6	11.2	21-64	.003
Education (years)	11.6	1.6	8-16	.023
Experience (months)	65.7	59.3	3-300	-.057

Cross-Validation Sample (Utah and Pennsylvania)

The cross-validation sample is comprised of two sub-samples of women employed as Nurse Aides 2-42.20 in Utah and Pennsylvania.

A. Utah

During May and June 1954, the GATB, B-1002A, was administered to 115 women employed as Nurse Aides 2-42.20 at three hospitals located in Salt Lake City and Ogden, Utah. The number of people tested in each hospital is as follows:

Hospital	Location	N
Salt Lake General Hospital	Salt Lake City, Utah	22
Saint Mark's Hospital	Salt Lake City, Utah	27
Latter-Day Saint's Hospital	Salt Lake City, Utah	66
		N=115

B. Pennsylvania

During July 1953, the GATB, B-1002A, was administered to a final sample of 40 women employed as Nurse Aides 2-42.20 at the Presbyterian Hospital, Philadelphia, Pennsylvania. Workers are selected for this occupation on the basis of a personal interview. All individuals in the sample had at least one-month of on-the-job experience.

TABLE I-B

Means (M), Standard Deviations (σ), and Ranges for Age, Education, and Experience

Cross-Validation Sample (Utah and Pennsylvania)

N = 155	M	σ	Range
Age (years)	31.8	11.8	17-54
Education (years)	10.9	1.7	5-15
Experience (months)	18.8	20.3	1-134

III. Job Description

Job Title: Nurse Aide (medical ser.) 2-42.20

Job Summary:

Performs routine duties in the general care of hospital patients under supervision of a professional nurse. May also perform related duties, such as assembling and sterilizing packs of supplies, dressings and instruments; arranging supplies in stock rooms; scheduling clinic appointments for out-patients; and assisting in post-mortem care.

Work Performed:

Performs routine duties in the general health care of patients according to daily assignment sheet and verbal instructions. Escorts newly admitted patients to wards and rooms, assisting them in walking,and transports disabled patients on stretchers and wheelchairs. Assists patients in undressing and provides hospital clothing. Lists and stores patients' clothing and valuables. Administers oral hygiene, nail care, alcohol rubs, and massages to patients. Participates in giving patients shampoos, cleansing baths, Sitz baths, and showers. Turns, positions, and ambulates patients to induce ease and comfort, and to provide therapeutic treatment. Pushes food cart to food preparation station, prepares individual food trays according to diet slips, and serves food trays to patients. Assists patients with meals and feeds them when necessary. Removes food trays upon completion of meal, and records patients' food and fluid intake and output on charts as directed. Provides drinking water and between-meal nourishment. Answers patients' call lights or

bells, and assists patients with emesis basins, bed pans, and urinals. Collects sputum, fecal, and urine specimens as directed. Remakes occupied and unoccupied beds with clean linen, and rearranges bed cloths and pillows for patients' comfort. Collects and disposes of sputum cups, refuse bags, and other items of trash from patients' bedside, and supplies patients with clean sputum cups and refuse bags. Escorts visitors and transmits messages between patients and patients' families. Cleans patients' rooms and furnishings, and maintains comfortable environment for patients by regulating ventilation and lighting. Arranges and cares for patients' flowers.

Performs routine duties in the general nursing care of patients according to daily assignment sheet and verbal instructions. Takes patients' temperature, pulse, respiration, and blood pressure and records results on patients' charts as directed. Prepares patients for surgery and delivery by washing, drying, and applying antiseptic solutions to involved skin areas. Administers unmedicated douches and enemas, and similar treatments as directed. Applies dressings, hot and cold compresses, ice collars, ice bags, and hot water bottles. Hangs bottle of liquid food on holding rack; attaches free end of Gavage Tube (which has been inserted through patient's nose to esophagus by physician) to bottle, adjusts height of holding rack, and regulates hose clamp to permit specified amounts of food to enter stomach of patients unable to take nourishment in normal manner. Inserts soft rubber catheter into mouth or throat of critically ill patients and starts attached pump to withdraw phlegm and fluid. Inserts catheter into patients' bladder, through urethra, to promote dependent draining of bladder. Attaches Stryker Frame to bed over patient and manipulates controls of frame to reposition patient. Maintains specified respirator pressures. Instructs disabled patients in self-feeding and dressing. Aids mentally disturbed patients by maintaining friendly, firm, and solicitous attitude. Reads to patients and encourages them to utilize social and recreational activities therapeutically designed for rehabilitation. Observes and records patients' behavior and reactions, and reports unfavorable conditions to professional nurse.

Performs routine duties in the maintenance and issuance of supplies and equipment in prescribed manner. Assembles packs of supplies, dressings, and instruments for sterilization. Sterilizes packs as directed, by soaking in antiseptic solutions, by boiling, or by placing them in a steam sterilization cabinet. Sterilizes such supplies as gloves, gowns, rubber tubing, syringes, needles, and linen. Arranges supplies, dressings, and instruments required for surgery and treatment. Assists in maintaining perpetual inventory and prepares written requisitions to re-order depleted stock.

Performs routine duties in clinics and admitting rooms according to procedure. Schedules patients' appointments and routes new patients to various out-patient clinics. Records appointments on patients' record charts. Prepares record folders for new patients. Removes patients' record folders according to appointment schedules, and returns folders to files upon completion of records by attending physicians. Calls

patients from waiting room and escorts patients to examination or treatment booths. Makes out patients' future appointment slips and records future appointments in clinic appointment books. Renews cancelled appointments by phone or mail. Answers phones and delivers messages

Performs routine duties common to all wards according to daily assignment sheet and verbal instructions. Assists in maintaining privacy and isolation of patients in wards, including exclusion of other patients. Assists in post-mortem care by affixing identification tag, cleaning body, and covering with shroud.

IV. Criterion

Validation Sample (California)

The criterion data collected consisted of two sets of independent ratings made by the first-line supervisor at each hospital on USES Form SP-21, "Descriptive Rating Scale". A period of at least two weeks elapsed between the first and second ratings. The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. A reliability coefficient of .86 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final criterion scores of 40-90 with a mean of 64.6 and a standard deviation of 9.9.

Cross-Validation Sample (Utah and Pennsylvania)

The criterion for the Utah subsample consisted of supervisory ratings in the following four broad category job performance groupings: (1) outstanding, (2) above average, (3) average, and (4) below average. Two separate ratings, prepared over a two week interval, were obtained for each worker. The two ratings, when combined, yielded seven levels of proficiency. Quantitative scores were calculated for these seven broad catagories. For the combined sample, the final quantitative scores were 65, 59, 53, 41, 33, and 29, respectively.

The criterion for the Pennsylvania subsample consisted of supervisory rank-order ratings. Since the supervisor of Nurse Aides is responsible for supervising the overall work program of the Nurse Aides, she is acquainted with their work performance and therefore was considered to be qualified to rate them. The final criterion scores consisted of the rank-order ratings converted to linear scores.

V. Experimental Battery

All the tests of the GATB, B-1002B, were administered to the validation sample (California) and all the tests of the GATB, B-1002A, were administered to the cross-validation sample (Utah and Pennsylvania).

VI. Qualitative and Quantitative Analyses

A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

G - Intelligence - Required to learn and apply training received in hospital administration, patient care, and nursing techniques; to expeditiously carry out instructions received verbally or as set forth in daily assignment sheets; and to be able to reason and make judgements while observing patients in order to note and report symptoms and reactions of patients which may indicate an unusual change in physical or mental conditons.

Q - Clerical Perception - Required to read and record on chart, temperature, pulse rate, respiration rate, and blood pressure; to record patient's food and fluid intake and output; to fill requisitions from stock, prepare written requisitions, to re-order depleted stock, and to take stock inventory. Also required to schedule patient's appointments, prepare record folders, and perform routine filing and clerical tasks.

F - Finger Dexterity - Required to apply dressings; administer various treatments such as catheterizations, enemas, and douches; to take temperatures, pulse rates, and blood pressures; and to assemble surgical packs and trays containing supplies, dressings, and instruments.

M - Manual Dexterity - Required to move, transport, lift, turn, position, dress, and otherwise handle patients; to make beds, push food carts, and to perform general cleaning tasks; to handle equipment and instruments; and to store supplies in designated places in stockroom.

B. Quantitative Analysis: Validation Sample - California

TABLE II

Means (M), Standard Deviations (σ), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 199

Aptitudes	M	σ	r
G-Intelligence	88.6	14.5	.225**
V-Verbal Aptitude	95.2	13.6	.151*
N-Numerical Aptitude	84.7	16.2	.252**
S-Spatial Aptitude	91.0	15.6	.110
P-Form Perception	91.2	17.9	.177*
Q-Clerical Perception	99.7	14.5	.136
K-Motor Coordination	100.4	16.8	.213**
F-Finger Dexterity	85.8	18.0	.114
M-Manual Dexterity	93.9	19.8	.100

**Significant at the .01 level
*Significant at the .05 level

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

Type of Evidence	Aptitudes								
	G	V	N	S	P	Q	K	F	M
Job Analysis Data									
Important	X					X		X	X
Irrelevant									
Relatively High Mean		X				X	X		
Relatively Low Sigma	X	X				X			
Significant Correlation with Criterion	X	X	X		X		X		
Aptitudes to be Considered for Trial Norms	G	V	N		P	Q	K		

Trial norms consisting of various combinations of Aptitudes G, V, N, P, Q and K with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of G-80, V-80 and K-85 had the best selective efficiency.

VII. Validity of Norms (Concurrent)

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 34 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV-A shows the relationship between test norms consisting of Aptitudes G, V and K with critical scores of 80, 80 and 85 respectively, and the dichotomized criterion for Nurse Aide 2-42.20. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV-A

Validity of Test Norms for Nurse Aide 2-42.20
(G-80, V-80, K-85)
Validation Sample (California)

N = 199	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	35	97	132
Poor Workers	40	27	67
Total	75	124	199

Phi Coefficient = .324
χ^2 = 20.895
P/2 < .0005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

Table IV-B shows the relationship between test norms consisting of Aptitudes G, V and K with critical scores of 80, 80 and 85 respectively and the dichotomized criterion for Nurse Aide 2-42.20. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV-B

Validity of Test Norms for Nurse Aide 2-42.20
(G-80, V-80, K-85)
Cross-Validation Sample (Utah and Pennsylvania)

N = 155	Non-Qualifying Test Scores	Qualifying Test Scores	Total
Good Workers	41	66	107
Poor Workers	34	14	48
Total	75	80	155

Phi Coefficient = .301
χ^2 = 14.105
P/2 < .0005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

VIII. Conclusions

On the basis of the results of this study, Aptitudes G, V and K with minimum scores of 80, 80, and 85, respectively, have been established as B-1002 norms for Nurse Aide 2-42.20. The equivalent B-1001 norms consist of G-85, V-80, and T-80.

IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.